REMARKS

1. Claim Objections

Regarding Claim 9, Applicant has amended Claim 9 as suggested by the Examiner under section 3 of the Office Action.

2. Claim Rejections – 35 USC 102

In section 4 of the Office Action, the Examiner states that several claims are anticipated by US patent No. 5,687,191 to Lee.

Applicant respectfully disagrees with this statement given by the Examiner for the reasons given in detail below.

Further, Applicant notes that Lee was the main reference in the international proceedings, but the European Patent Office as the authorized International Preliminary Examination Authority stated in the International Preliminary Examination Report that all claims are novel and inventive in view of Lee. While certainly not binding in the U.S. prosecution, this fact in nonetheless instructive.

U.S. Patent No. 5,687,191 (Lee) discloses a concept for transferring hidden data after data compression. By means of a subband encoder, an audio signal is converted to subband samples, wherein each subband filter generates a sequence of temporal samples, the spectral band width of which is equal to the band width of the respective subband filter. A data stream with such quantized subband samples is packed up and demultiplexed so as to perform an inverse quantization, such that subband samples are again present. Furthermore, a pseudo-noise spread sequence is filtered by means of a subband filter bank so as to obtain, for each filter of the subband filter bank, a sequence of temporal subband samples having a band width determined by the respective subband filter. The data to be

transported are subjected to a feed-forward correction and a performance control ensuring that the auxiliary data signal is below the noise quantization floor of the audio subband samples. The auxiliary data samples processed such are connected to respective subband samples of the pseudo-noise spread sequence by means of respective modulators and then linked to the packed-up subband samples of the audio signal by means of XOR gates. The combined subband samples obtained such are then re-quantized and packed so as to obtain an output data stream.

The invention, as defined in Claim 1, is novel as compared to Lee for at least the following reasons:

Lee describes a subband encoder which does not generate, from an audio signal, any spectral values representing a short-term spectrum of an audio signal. Instead, a subband encoder generates several also temporal sample streams with a smaller band width from an audio signal with a large band width (column 3, lines 44 to 50 of Lee).

Therefore, Lee does not disclose any data stream comprising data on spectral values representing a short-term spectrum of an audio signal as the data stream mentioned in Lee does not comprise any spectral values at all.

Thus, Lee neither discloses the second paragraph of Claim 1. In the claimed invention, spectral values of the short-term spectrum are obtained whereas in Lee, temporal subband samples are obtained. Nor does Lee disclose the third paragraph of Claim 1. According to the invention, the information to be introduced is weighted with a spread sequence. In contrast to that, in Lee a spread sequence PN, reference numeral 412 in Figure 4, is first filtered with a subband filter bank. Thus, in Lee the auxiliary data on line 414 is not contacting the spread sequence PN (line 412).

Further, Lee does not disclose the fourth paragraph of Claim 1. In Lee, no spectral representation of the spread information signal is generated. At first, no spectral representation of any signal is generated in Lee. In addition, nothing is transformed to the frequency domain behind the modulators 430, 432, 434, 436 as is shown by Figure 4 and the associated description of Lee.

Nor does Lee disclose the fifth paragraph of Claim 1. In Lee, no psychoacoustically maskable interference energy is determined as a function of the frequency for the short-term spectrum of the audio signal. This is due to the fact that Lee does not use such a short-term spectrum. The only place in Lee at which a performance control is performed relative to the information to be incorporated, that is, the auxiliary data, is to be found in column 11, lines 53 to 62. Here, a noise quantization floor of the audio subband samples is mentioned but not, however, a psychoacoustically maskable interference energy as a function of the frequency for the short-term spectrum of the audio signal, and in particular, no remark is made at this point in Lee that the psychoacoustically maskable interference energy be less than or equal to the psychoacoustical masking threshold of the short-term spectrum.

Nor does Lee disclose the sixth paragraph of Claim 1. Even if the operation of the modulator 420 were equated with the operation of the weighting, in Lee, the auxiliary data signal is directly modulated by means of the performance control signal 419. However, according to the sixth paragraph of Claim 1, it is the spectrally spread information signal and not the information signal as such that is weighted.

Nor does Lee disclose the seventh paragraph of Claim 1, which refers to the summing. It is true that the elements 440, 442, 444, 446 are represented in Figure 4 by means of a "plus sign". In contrast to that, however, they are, in column 11, lines 13 to 20 commonly designated as "combiners", which may, for example, be XOR gates. It is well known that XOR gates differ from summers.

Nor does Lee disclose the last paragraph of Claim 1 because no cumulative spectral values but combined subband samples are processed in Lee (column 11, lines 64 to 66 of Lee).

Therefore, Claim 1 is novel with respect to Lee.

Another difference between the claimed invention and Lee is that Lee refers to a subband encoder whereas the claimed invention refers to a transform encoder generating the data stream the information must be incorporated into.

A further fundamental difference between the claimed invention and Lee lies in the fact that the processing of the spread information takes place differently.

A further difference is that the claimed invention, a spectrally spread information signal is weighted using a psychoacoustically maskable interference energy, which is less than or equal to the psychoacoustical masking threshold. Such a feature is not to be found in Lee.

Furthermore, the claimed invention is not rendered obvious by Lee, especially because Lee does not provide any indication as to how information can be incorporated to a data stream generated by a transform encoder, which comprises data on spectral values.

In contrast to page 3, third paragraph of the Office Action, it is clear that there is a difference between temporal subband samples, on the one hand, and spectral values, on the other hand. There is column 3, lines 32 in Lee. It is thus correct that, here, a general reference is made to transform encoding, which is, however, to be found in the section referring to the prior art of Lee. However, Lee does not contain any information on how information is incorporated to a transform-encoded data stream, but only on how this may take place for a subband-encoded compressed data stream (column 4, line 65 to column 5, line 1). As stated before, subband samples are time domain samples!

The Examiner may consider the blocks 404, 405 to be equivalents for the step of the processing. However, according to the invention, spectral values are generated here, whereas in Lee temporal subband samples are generated.

As to the step of the weighting, the Examiner may consider the elements 430, 432, 434, 436. The respective blocks, however, do not result in the information being weighted with a spread sequence, but in a modulation of an auxiliary-data wave form with subband samples of a spread sequence.

As to the step of establishing, the Examiner points to column 7. As can be seen from column 7, lines 24 and 25, the psychoacoustical model is not used for incorporating information but for generating the subband. As opposed to the definition of Claim 1, which

refers to a method for incorporating information, Lee discloses the element 160 of Figure 1 in connection with generating subband samples only.

The Examiner may consider the elements 440, 442, 444, 446 as a disclosure of Lee regarding the step of summing. However, as has been explained, Lee denotes these element as combiners and specifically as XOR gates, but not as summers.

As to the step of the processing of the sum spectral values, the Examiner mixes sum subband samples and sum spectral values. Quantizer 454 and the data-stream packer 460 only process subband samples from column 13, lines 64 and 65.

Specifically, with reference to page 4, third paragraph of the Office Action, the Examiner states that the step of weighting the spectral spread information signal corresponds to the action done by power control 419 and multiplier 420. The Examiner points to column 11, lines 43 to 62. However, it is not correct that the auxiliary data are a "spectral spread information signal." The auxiliary data are simply an information signal, and there is no spectral spreading in the auxiliary data. The Examiner overlooks that the spectral spread information signal is not the auxiliary data on line 414 in Fig. 5.

With reference to page 3, third paragraph of the Office Action, regarding the processing step, the Examiner points to the filter bank 120. It is true that this is a subband filterbank and there are differences between spectral values and subband samples, as stated above.

Then, regarding the combining step, the Examiner points to column 11, lines 26 to 37 and Fig. 4. The "information" to be introduced into the data stream are, in the Examiner's reasoning, values SPD_0, SPD_1??, SPD_{N-1}. This would mean that the pseudo-noise sequence on line 412 is the "information to be added before a subband filterbank processing in subband filterbank 410." On the other hand, however, the Examiner states that the pseudo-noise sequence on line 412 is the "spread sequence" of Claim 1. However, the spread sequence cannot be the same as the information signal. Claim 1 clearly distinguishes between the spread sequence and the information signal as becomes clear by the wording of the step of combining. One cannot combine one and the same information with itself.

Thus, the Examiner's reasoning is, correct because the Examiner on the one hand states that SPD_0, SPD_1, SPD_2,..., SPD_{N-1} are spread spectrum signals (page 3, penultimate paragraph of the Office Action), while the Examiner states on page 3, line 4 that the auxiliary data on line 414 is the "information signal" of Claim 1.

It is technically not correct in view of Lee when the Examiner says that there are "auxiliary data subband samples" in Lee. The auxiliary data is never input into a subband filterbank. Instead, the pseudo-noise signal PN 412 is input into a subband filterbank.

When the Examiner states that the pseudo-noise sequence corresponds to the "spread sequence" of Claim 1 and the auxiliary data correspond to the information signal, and when the Examiner states that the subband filterbank is the same as a tranform, then Lee does not disclose all steps of Claim 1. In the step of combining (third paragraph of Claim 1), the information is combined with a spread sequence. This combination is performed before generating the spectral representation.

Contrary thereto, the auxiliary data in Lee is never spread, but the spreading sequence is subband filtered. Thus, on the Examiner's assumptions, a spectral representation of the spread sequence is generated and the spectral representation of the spread sequence is combined to the auxiliary data. Therefore, in the Examiner's view, the step of generating would have to read "generating a spectral representation of the information signal" (without spread), and the step of combining would have to read "combining a spectral representation of the spread signal with the information signal."

However, the steps of combining and generating of claim are worded differently.

Regarding the establishing step, the Examiner points to column 7, lines 23 to 34. However, the Examiner does not pay attention to the fact that, in the weighting step, "the established noise energy" is referred to, *i.e.*, the noise energy as established in the step of establishing.

The Examiner states that the psychoacoustic maskable noise energy is SMR, but, then, in the Examiner's reasoning of the weighting step, this SMR is not at all referred to in column 11, lines 53 to 62.

Furthermore, when one has an even more closer look to column 11, penultimate paragraph and Fig. 5, it becomes clear that there is a single power control value on line 419 which is used for weighting the auxiliary data 420. Modulator 420 outputs a single modulated auxiliary data signal, *i.e.* a single value which is applied to time-domain subband samples in each subband simultaneously.

On the other hand, the signal to mask ratio is a value indicative of a noise level in each subband which, normally, is different from subband to subband. However, in Fig. 5, one and the same value is applied to each subband. Therefore, it is evident that column 11, lines 43 to 62 does not say that Lee uses "the established noise energy" to generate a weighted information signal.

Furthermore, regarding the summing step, Applicant repeats that modulators 433, 435, 437, 439 are not described to be "summers". While column 11, line 65 says that there is "a combining," in any sense, Claim 1 has a much more specific wording, *i.e.* that a summing takes place.

Regarding the step of processing, the Examiner points to Fig. 1, but this is not correct, because Fig. 1 does not disclose any adding of information, but only discloses a straight-forward audio encoder without any additional information introducing capabilities.

The same is true for column 8, lines 7 to 17, in which only the straight-forward encoder of Fig. 1 is described, but without any reference to any added information. Therefore, the Examiner's citations fail to show the limitations of Claim 1 that "the sum spectral values" are processed to obtain a processed data stream which includes information to be introduced.

In view of the foregoing, the application is deemed to be in allowable condition. Applicant respectfully requests that the Examiner withdraw his rejection and allow the application to pass to issuance as a U.S. Letters Patent. Should the Examiner deem it helpful, he is encouraged to contact Applicant's attorney, Michael A. Glenn at (650) 474-800.

Respectfully submitted,

Michael A. Glenn
Reg. No. 30,176

Customer No. 22862